

varian 620/RPG system

PROGRAM

```
*DATE DEFINING STATEMENTS
RECORD DATA
  DEPT (1, 3), #C1
  ACCT (10, 24), #C2
  EMPNO (4, 9), #C3
  HOURS (75, 80.1)
RECORD HEAD
  (16, 25), 'DEPARTMENT'
  (28, 41), 'ACCOUNT NUMBER'
  (47, 54), 'EMPLOYEE'
  (59, 63), 'HOURS'
RECORD OUTPUT
  DEPT (20, 22), B, P (#C1)
  ACCT (28, 42), B, P (#C2)
  EMPNO (48, 53)
  EHOURS (59, 64.1), B, Z, D
RECORD SUBTOT
  AHOURS (66, 71.1), B, Z, D
RECORD TOTAL
  DHOURS (73, 78.1), B, Z, D

*PROCEDURAL STATEMENTS
10 READ CARD, INPUT
  *ON PAGE OVERFLOW PRINT PAGE HEADING
  (#OV) SKIP
  (#OV) PRINT HEAD
  (#OV) SPACE
  *ON CONTROL BREAK 3 PRINT EMPLOYEE SUMMARY
  (#C3) COMPUTE AHOURS = AHOURS + EHOURS
  (#" ) PRINT OUTPUT
  *ON CONTROL BREAK 2 PRINT ACCOUNT SUMMARY
  (#C2) COMPUTE DHOURS = DHOURS + AHOURS
  (#" ) PRINT SUBTOT
  *ON CONTROL BREAK 1 PRINT DEPARTMENT SUMMARY
  (#C1) PRINT TOTAL
  *TERMINATE PROGRAM AFTER LAST CARD
  (#LR) STOP 'END OF REPORT'
  *ON NEW EMPLOYEE POST EMPLOYEE INFORMATION
  (#C3) POST INPUT, OUTPUT
  *ACCUMULATE EMPLOYEE'S HOURS
  COMPUTE EHOURS = EHOURS + HOURS
  GO TO 10
END
```

DATA

```
10A210356ALPHA-29107      1200
10A210356ALPHA-29107      800
10A350017ALPHA-29107      392
10A350017ALPHA-29107      1500
10A151179BETA-35          800
10A161711BETA-35          800
10A290238BETA-35          800
10A750192BETA-35          800
25B019372HOUSE-1957       505
25B019372HOUSE-1957       405
25B019372HOUSE-1957       50
25B317911HOUSE-1957       1500
25B607712HOUSE-1957       1200
/*
END
```

DEPARTMENT	ACCOUNT NUMBER	EMPLOYEE	HOURS
10A	ALPHA-29107	210356	200,0
		350017	189,2
			389,2
		BETA-35	151179
			80,0
25B	HOUSE-1957	161711	80,0
		290238	80,0
		750192	80,0
			320,0
			709,2
		019372	96,0
		317911	150,0
		607712	200,0

... a complete hardware / software system for commerce and industry

Varian 620/RPG System

The Varian 620/RPG Report System is a complete hardware/software package for general data processing applications. It combines versatile file and record defining capabilities with powerful processing statements to solve a wide range of applications. It is particularly effective in the specific application of processing data for reports.

The Varian 620/RPG system consists of both hardware and software elements. The minimum equipment required to operate the system is a 4K Varian 620/i or Varian 620/f computer, a line printer for producing reports, a card reader to enter data, and a card punch to record intermediate information and aid in the preparation of the programs that process the data. An expanded system includes such additional peripheral devices as a magnetic tape transport or disc.

The principal software element supplied by Varian with the system is an RPG IV (Report Program Generator) Compiler. This is the computer program that allows the user to write his application program in a simple, easy-to-use language and to generate short, concise programs for the processing of the information into tabular form. Other software elements supplied with the system are a special RPG loader, run-time support program, and special sub-routines required to operate RPG IV application programs on a Varian 620/i or 620/f computer. The software package is adaptable to both a minimum and an expanded computer configuration.

RPG IV

The RPG IV compiler is an advanced version of RPG systems now widely used throughout industry for commercial applications. Application programs written in the RPG IV language are far more concise than the equivalent programs written in COBOL. In typical instances, only a fourth or a third of the program steps are required, resulting in faster processing and a reduction in the amount of memory required to store the program.

RPG IV improves on common RPG language by providing many automatic features as well as powerful procedural statements. Each statement is written in a free-form format, simplifying the programmer's task.

An application program written in the RPG IV language consists of a series of statements (listed on the opposite page). Each statement is a concise directive; the number of names and labels is small, yet meaningful. Such functions as automatic scaling of numeric data, sequence checking and auditing of input records and fields are built into the language, relieving the programmer of having to perform these tasks through multiple directives.

Supplied with the Varian 620/RPG system is a complete users manual to aid the user in the programming of applications.

Equipment Features

The Varian 620/i and 620/f computers represent the most advanced data processing devices in their class. Both are 16-bit machines featuring fast processing times, an extended instruction capability, and versatile interfacing with all commonly available peripheral devices.

The Varian 620/f, latest in the evolving line of Varian 620 computers, is high speed unit with a machine cycle time of only 750 nanoseconds, making it the fastest mini-computer on the market. Other special features include an expanded instruction set for writing fast and highly efficient programs, an optional read-only memory (ROM) for storing fixed or tabular data, and new operating controls that provide for simple and flexible operation.

The Varian 620/i has been one of the outstanding successes of the mini-computer industry. Over 1,200 units are in service throughout the world. With a machine cycle time of 1.8 microseconds, it is the price/performance leader in its field.

The standard line printers supplied with the Varian 620/RPG system are 200 or 600 line-per-minute units, 132 characters per line, with a choice of 64 alphanumeric characters and symbols.

The card readers are designed to read 80-column cards at rates of 400 or 1,000 cards per minute. The card punches produce 80-column cards at rates of 50 or 200 cards per minute.

Operating the System

Operation of the Varian 620/RPG system is in two stages. These are summarized in the diagrams to the right.

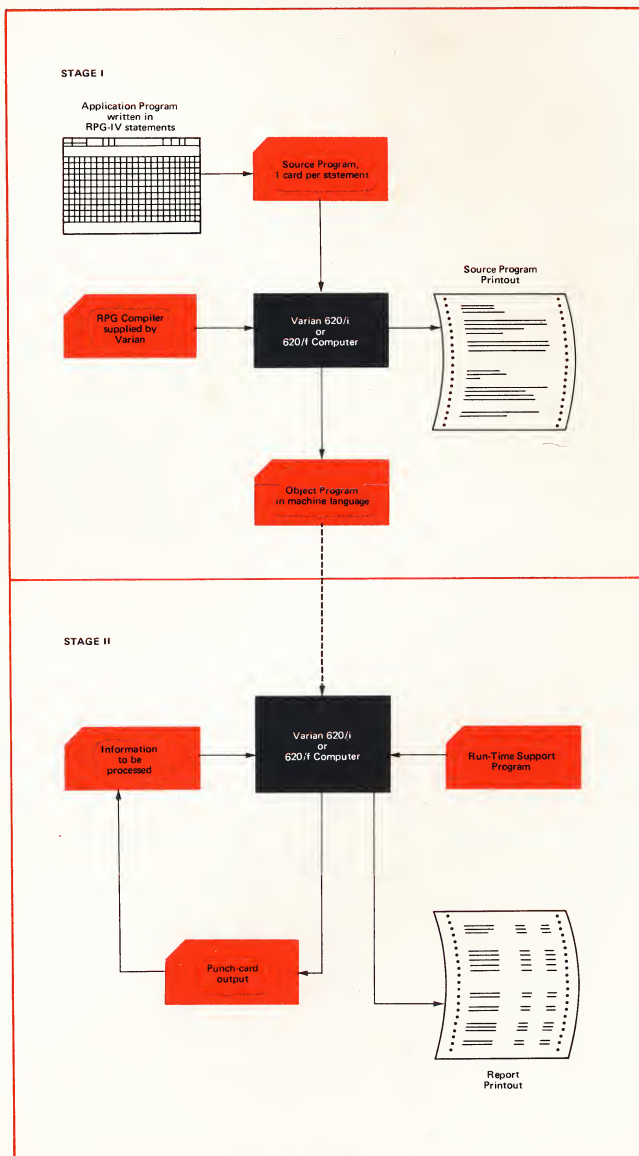
The first stage is the preparation of the specific application program that will produce a required report. Using the RPG IV language, the programmer writes a series of statements that define the data that is to be processed, any calculations that are to be performed, and the contents and format of the finished report or output file. These statements, which together make up the RPG source program, are transferred to punched cards, one statement per card.

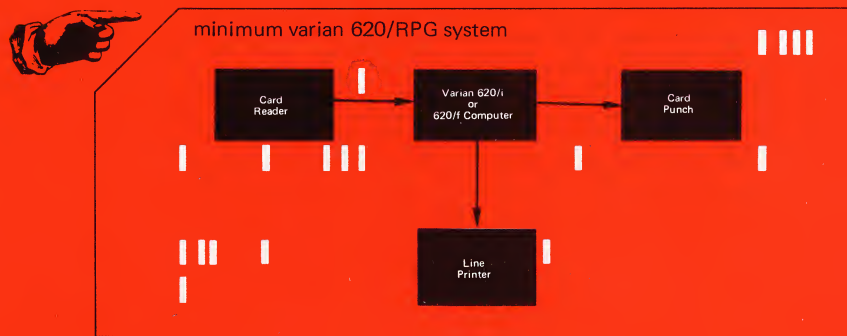
Using a special loader program supplied by Varian, the RPG IV compiler program is loaded into the computer core memory. The cards representing the RPG source program are then read by the card reader and the individual statements processed by the compiler program to produce a second deck of punched cards representing the RPG object program. The object program is a translation of the source program into a series of machine instructions that will be used by the computer in preparing the final report. The computer also produces a printed output of the original source program for reference and file.

Stage two is the processing of the actual data into a finished report. The RPG Compiler Program has now performed its function and is overlaid in memory by the incoming data. The object program produced by the first stage is read into memory, along with a run-time support program supplied by Varian. The raw data on punch cards is then read by the card reader and processed by the computer.

The principal output is a printed record, prepared on the line printer, in finished form ready for distribution.

In certain applications, the program may also output a portion or all of the processed data on punched cards, to be used as input data for later processing. Typical would be a record of an updated end-of-the-month inventory, which would then be used as a start-of-the-month inventory record at the end of the following month.





RPG IV LANGUAGE

DATA DEFINING STATEMENTS

The data defining statements provide the program with a description of the data structures used.

RECORD Statement

The RECORD statement defines storage for a group of data fields known as a record.

Record Field Statement

The field statements for a record directly follow the RECORD statements. The field statements may appear in any order and may define overlapping fields.

TABLE Statement

The TABLE statement identifies a table that is internal to the program.

PROCEDURAL STATEMENTS

The procedural statements direct the program execution.

MOVE Statement

The MOVE statement causes the contents of one field to be moved into one or more other fields.

COMPUTE Statement

The COMPUTE statement causes a computation to be performed and the result to be placed in a specified field.

COLLECT Statement

The COLLECT statement causes the fields in one record or table entry that have the same names as the fields in another record or table entry to be added correspondingly into those fields.

ENTER Statement

The ENTER statement causes the fields in a record that have the same names as the fields in the designated table to be entered (moved) correspondingly into those fields.

DELETE Statement

The DELETE statement causes an entry to be deleted from a table.

LOOKUP Statement

The LOOKUP statement is used to find an entry in a sequenced table with a key equal to or greater than a specified key.

PRINT Statement

The PRINT statement causes one line to be printed on the printer device.

SKIP Statement

The SKIP statement causes the printer to skip to a designated line position on the page as determined by the vertical page formatting tape inserted in the line printer.

SPACE Statement

The SPACE statement causes the printer to space a specified number of lines.

PUNCH Card Statement

The PUNCH card statement causes one card to be punched.

READ Statement

The READ statement causes a record to be read from the card reader.

CALL Statement

The CALL statement links the RPG program to an assembler language subroutine.

GO TO Statement

The GO TO statement changes the flow of the program by directing the program to the next statement to be executed.

Indexed GO TO Statement

The indexed GO TO statement changes the flow of the program by selecting one of many statement numbers through an index.

PERFORM Statement

The PERFORM statement causes the flow of the program to be changed by specifying the next statement to be executed. It also causes the present location to be remembered.

RETURN Statement

The RETURN statement causes the flow of the program to return to the statement following its corresponding PERFORM statement.

SET Statement

The SET statement causes one or more indicators to be set to a specified condition, on or off.

STOP Statement

The STOP statement causes the program to halt execution and gives an appropriate message to the computer operator.

END Statement

The END statement is the last statement of the program. It is not executable; it merely serves to indicate the physical end of the program.

STATEMENTS FOR EXPANDED SYSTEMS

The basic system for implementing RPG-IV consists of a computer, line printer, card reader and card punch. The following statements apply to expanded systems that include magnetic tapes or a random access device.

FILE Statement

The FILE statement describes a file that is external to the program.

READ Statement

The READ statement causes a record to be read from one of the program files. (Replaces READ card statement for minimum configuration.)

WRITE Statement

The WRITE statement causes a record to be written to one of the program files.

ERASE Statement

The ERASE statement causes a record to be erased from an index sequential file.

ENDFILE Statement

The ENDFILE statement causes an end-of-file mark to be written to one of the program files.

RESTART Statement

The RESTART statement causes a file to be repositioned at its starting point.

DEBUG Statement

The DEBUG statement causes the condition of all the indicators to be printed on the line printer.

ACCEPT Statement

The ACCEPT statement causes keyboard input to be accepted.

TYPE Statement

The TYPE statement causes the typewriter to perform control functions and type messages.

PHASE Statement

The PHASE statement allows segmentation of a program into any number of overlay phases. Communication between phases is maintained by a common data area. The termination of execution in a phase is indicated by a GO TO PHASE statement.

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